

WHAT IS CLAIMED IS:

1. A peeling method comprising:

forming a metal layer over a substrate;

forming an oxide layer contacting with the metal layer;

5 forming an insulating film contacting with the oxide layer;

forming a semiconductor having an amorphous structure, and including hydrogen on the insulating film;

performing heat treatment for diffusing hydrogen;

10 adhering a support member to a layer to be peeled including the oxide layer, the insulating film and the semiconductor film; and

peeling the layer to be peeled adhered to the support member from the metal layer formed over the substrate by means of physical means.

2. A peeling method comprising:

15 forming a metal layer over a substrate;

forming an oxide layer contacting with the metal layer;

forming an insulating film contacting with the oxide layer;

forming a semiconductor having an amorphous structure, and including hydrogen on the insulating film;

20 performing heat treatment for diffusing hydrogen;

forming a thin film transistor comprising the semiconductor film as an active layer and an element connected with the thin film transistor;

adhering a support member to a layer to be peeled including the oxide layer, the insulating film, the thin film transistor and the element connected with the thin film transistor;

and

peeling the layer to be peeled adhered to the support member from the metal layer formed over the substrate by means of physical means.

5           3. A peeling method comprising:

forming a first metal layer over a substrate;

forming an oxide layer contacting with the first metal layer;

forming an insulating film contacting with the oxide layer;

forming a second metal layer including hydrogen on the insulating film;

10           performing heat treatment for diffusing hydrogen;

forming a thin film transistor and an element connected with the thin film transistor;

and

adhering a support member to a layer to be peeled including the oxide layer, the insulating film, the thin film transistor and the element; and

15           peeling the layer to be peeled adhered to the support member from the first metal layer formed over the substrate by means of physical means.

4. A peeling method comprising:

forming a metal layer including hydrogen over the substrate;

20           forming an oxide layer contacting with the metal layer;

forming an insulating film in contact with the oxide layer;

forming a semiconductor film having an amorphous structure, and including hydrogen on the insulating film;

performing heat treatment for diffusing hydrogen;

forming a thin film transistor including the semiconductor film as an active layer and an element connected with the thin film transistor; and

adhering a support member to a layer to be peeled including the oxide layer, the insulating film, the thin film transistor and the element; and

5       peeling the layer to be peeled adhered to the support member from the metal layer formed over the substrate by means of physical means.

5. A peeling method according to claim 1, wherein the heat treatment is performed at a temperature equal to or higher than a temperature at which hydrogen in a film is emitted or  
10   diffused.

6. A peeling method according to claim 2, wherein the heat treatment is performed at a temperature equal to or higher than a temperature at which hydrogen in a film is emitted or  
15   diffused.

7. A peeling method according to claim 3, wherein the heat treatment is performed at a temperature equal to or higher than a temperature at which hydrogen in a film is emitted or  
diffused.

20       8. A peeling method according to claim 4, wherein the heat treatment is performed at a temperature equal to or higher than a temperature at which hydrogen in a film is emitted or  
diffused.

9. A peeling method according to claim 1, wherein the metal layer is a single layer

comprised of an element selected from the group consisting of W, Ti, Ta, Mo, Cr, Nd, Fe, Ni, Co, Zr, Zn, Ru, Rh, Pd, Os, Ir, and Pt or an alloy material or compound material that contains the element as its main constituent, or is a lamination layer comprised of the metals or mixtures thereof.

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10. A peeling method according to claim 2, wherein the metal layer is a single layer comprised of an element selected from the group consisting of W, Ti, Ta, Mo, Cr, Nd, Fe, Ni, Co, Zr, Zn, Ru, Rh, Pd, Os, Ir, and Pt or an alloy material or compound material that contains the element as its main constituent, or is a lamination layer comprised of the metals or mixtures thereof.

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11. A peeling method according to claim 3, wherein the metal layer is a single layer comprised of an element selected from the group consisting of W, Ti, Ta, Mo, Cr, Nd, Fe, Ni, Co, Zr, Zn, Ru, Rh, Pd, Os, Ir, and Pt or an alloy material or compound material that contains the element as its main constituent, or is a lamination layer comprised of the metals or mixtures thereof.

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12. A peeling method according to claim 4, wherein the metal layer is a single layer comprised of an element selected from the group consisting of W, Ti, Ta, Mo, Cr, Nd, Fe, Ni, Co, Zr, Zn, Ru, Rh, Pd, Os, Ir, and Pt or an alloy material or compound material that contains the element as its main constituent, or is a lamination layer comprised of the metals or mixtures thereof.

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13. A peeling method according to claim 1, wherein the oxide layer is a silicon oxide

film formed by sputtering.

14. A peeling method according to claim 2, wherein the oxide layer is a silicon oxide film formed by sputtering.

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15. A peeling method according to claim 3, wherein the oxide layer is a silicon oxide film formed by sputtering.

16. A peeling method according to claim 4, wherein the oxide layer is a silicon oxide film formed by sputtering.

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17. A peeling method according to claim 1, wherein the insulating film is a silicon oxide film, a silicon oxynitride film, or a lamination layer of the films.

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18. A peeling method according to claim 2, wherein the insulating film is a silicon oxide film, a silicon oxynitride film, or a lamination layer of the films.

19. A peeling method according to claim 3, wherein the insulating film is a silicon oxide film, a silicon oxynitride film, or a lamination layer of the films.

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20. A peeling method according to claim 4, wherein the insulating film is a silicon oxide film, a silicon oxynitride film, or a lamination layer of the films.

21. A peeling method according to claim 1, wherein a thickness of the oxide layer is

thicker than a film thickness of the metal layer.

22. A peeling method according to claim 2, wherein a thickness of the oxide layer is thicker than a film thickness of the metal layer.

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23. A peeling method according to claim 3, wherein a thickness of the oxide layer is thicker than a film thickness of the metal layer.

24. A peeling method according to claim 4, wherein a thickness of the oxide layer is thicker than a film thickness of the metal layer.

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25. A peeling method according to claim 2, wherein an element provided on the insulating film is a light emitting element, a semiconductor element, or a liquid crystal element.

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26. A peeling method according to claim 3, wherein an element provided on the insulating film is a light emitting element, a semiconductor element, or a liquid crystal element.

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27. A peeling method according to claim 4, wherein an element provided on the insulating film is a light emitting element, a semiconductor element, or a liquid crystal element.